

What is claimed is:

Sub A method for providing a data symbol having a first quadrature compensated data symbol (FQCDs), second quadrature compensated data symbol (SQCDs), a first in-phase compensated data symbol (FICDS) and a second in-phase compensated data symbol (SICDS) to an inverse fast fourier transform (IFFT) of a multicarrier quadrature modulator having an amplifier, wherein a first subcarrier data symbol and a second subcarrier data symbol are available from a mapper and an alpha, epsilon and gain are predetermined comprising the steps of:

first quadrature compensating the data symbol based on the alpha, epsilon and gain to produce a FQCDs;

second quadrature compensating the data symbol based on the alpha, epsilon and gain to produce a SQCDs;

first in-phase compensating the data symbol based on the alpha, epsilon and gain to produce a FICDS; and

second in-phase compensating the data symbol based on the alpha, epsilon and gain to produce a SICDS.

2. A method for providing a first quadrature compensated data symbol (FQCDs), second quadrature compensated data symbol (SQCDs), a first in-phase compensated data symbol (FICDS) and a second in-phase compensated data symbol (SICDS) to an inverse fast fourier transform (IFFT) of a multicarrier quadrature modulator having an amplifier, wherein at least four transmitted symbol are available from the amplifier and at least four data symbols and a next data symbol are available from a mapper comprising the steps of:

- a) calculating the energy of at least four transmitted symbols;
- b) calculating a alpha, epsilon and gain based on the energy of the at least four transmitted symbols and at least four data symbols;
- c) storing the alpha, epsilon and gain;
- d) first quadrature compensating the next data symbol first quadrature subcarrier based on the alpha, epsilon and gain to produce a FQCDs;
- e) second quadrature compensating the next data symbol second quadrature subcarrier based on the alpha, epsilon and gain to produce a SQCDs;
- f) first in-phase compensating the next data symbol first in-phase subcarrier

251 based on the alpha, epsilon and gain to produce a FICDS;

252 g) second in-phase compensating the next data symbol second in-phase
253 subcarrier based on the alpha, epsilon and gain to produce a SICDS; and

254 h) repeating steps a, b and c wherein the at least four transmitted symbols
255 include the next transmitted data symbol and the at least four data symbols include the
256 next data symbol.

257 3. The method of claim 2 wherein the step of calculating a alpha, epsilon and
258 gain further comprises the step of:

259 calculating a first alpha, first epsilon and a first gain based on the energy of the at
260 least for transmitted symbols;

261 calculating a second alpha, second epsilon and a second gain based on the
262 energy of the next data symbol;

263 calculating a alpha based on a average of the first alpha and the second alpha;

264 calculating a epsilon based on a average of the first epsilon and the second
265 epsilon; and

266 calculating a gain based on a average of the first gain and the second gain.

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268 4. The method of claim 2 wherein the step of calculating the energy of at least
269 four transmitted symbols further comprises the steps of:

270 a) sampling output of a transmitter to provide a sampled signal;

271 b) squaring the sampled signal to provide a squared sample signal; and

272 c) integrating the squared sample signal over a symbol duration.

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274 5. An apparatus for providing a first quadrature compensated data symbol
275 (FQCDS), second quadrature compensated data symbol (SQCDS), a first in-phase
276 compensated data symbol (FICDS) and a second in-phase compensated data symbol
277 (SICDS) to an inverse fast fourrier transform (IFFT) of a multicarrier quadrature
278 modulator having an amplifier, wherein at least four transmitted symbol are available
279 from the amplifier and at least four data symbols and a next data symbol are available
280 from a mapper comprising:

281 a) means for calculating the energy of at least four transmitted symbols;

282 b) means for calculating a alpha, epsilon and gain based on the energy of the at
283 least four transmitted symbols and at least four data symbols;

284 c) means for storing the alpha, epsilon and gain;

d) means for first quadrature compensating the next data symbol first quadrature subcarrier based on the alpha, epsilon and gain to produce a FQCDs;

e) means for second quadrature compensating the next data symbol second quadrature subcarrier based on the alpha, epsilon and gain to produce a SQCDs;

f) means for first in-phase compensating the next data symbol first in-phase subcarrier based on the alpha, epsilon and gain to produce a FICDS;

g) means for second in-phase compensating the next data symbol second in-phase subcarrier based on the alpha, epsilon and gain to produce a SICDS; and

h) means for repeating steps a, b and c wherein the at least four transmitted symbols include the next transmitted data symbol and the at least four data symbols include the next data symbol.

6. The apparatus of claim 5 wherein the means for calculating a alpha, epsilon and gain further comprises:

means for calculating a first alpha, first epsilon and a first gain based on the energy of the at least for transmitted symbols;

means for calculating a second alpha, second epsilon and a second gain based on the energy of the next data symbol;

means for calculating a alpha based on a average of the first alpha and the second alpha;

means for calculating a epsilon based on a average of the first epsilon and the second epsilon; and

means for calculating a gain based on a average of the first gain and the second gain.

7. The apparatus of claim 5 wherein the means for calculating the energy of at least four transmitted symbols further comprises:

a) means for sampling output of a transmitter to provide a sampled signal;

b) means for squaring the sampled signal to provide a squared sample signal;

and

c) means for integrating the squared sample signal over a symbol duration.